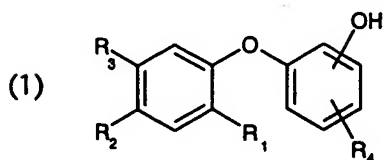


What is claimed is:

1. Use of hydroxydiphenyl ether compounds of the following formula



wherein when OH is in the para position with respect to the ether linkage

R<sub>1</sub> and R<sub>2</sub> are independently of each other hydrogen, hydroxy, C<sub>1</sub>-C<sub>20</sub>alkyl, C<sub>3</sub>-C<sub>7</sub>cycloalkyl, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl, C<sub>1</sub>-C<sub>20</sub>alkoxy, phenyl or phenyl-C<sub>1</sub>-C<sub>3</sub>alkyl;

R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl or C<sub>1</sub>-C<sub>20</sub>alkoxy;

R<sub>4</sub> is hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl, hydroxy substituted C<sub>1</sub>-C<sub>20</sub>alkyl, C<sub>3</sub>-C<sub>7</sub>cycloalkyl, hydroxy, formyl, acetyl, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl, C<sub>2</sub>-C<sub>20</sub>alkenyl, carboxy, carboxyC<sub>1</sub>-C<sub>3</sub>alkyl, C<sub>1</sub>-C<sub>3</sub>alkylcarbonylC<sub>1</sub>-C<sub>3</sub>alkyl or carboxyallyl;

wherein when OH is in the meta position with respect to the ether linkage

R<sub>2</sub> is hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl, hydroxy substituted C<sub>1</sub>-C<sub>20</sub>alkyl or C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl;

R<sub>1</sub> and R<sub>3</sub> are independently of each other hydrogen, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl or C<sub>1</sub>-C<sub>20</sub>alkyl;

R<sub>4</sub> is hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl, hydroxy substituted C<sub>1</sub>-C<sub>20</sub>alkyl, C<sub>3</sub>-C<sub>7</sub>cycloalkyl, hydroxy, formyl, acetyl, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl, C<sub>2</sub>-C<sub>20</sub>alkenyl, carboxy, carboxyC<sub>1</sub>-C<sub>3</sub>alkyl, C<sub>1</sub>-C<sub>3</sub>alkylcarbonylC<sub>1</sub>-C<sub>3</sub>alkyl or carboxyallyl;

wherein when OH is in the ortho position with respect to the ether linkage

R<sub>1</sub> is hydrogen, C<sub>1</sub>-C<sub>6</sub>alkyl carbonyl or C<sub>1</sub>-C<sub>20</sub>alkyl;

R<sub>4</sub> is hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl, hydroxy substituted C<sub>1</sub>-C<sub>20</sub>alkyl, C<sub>3</sub>-C<sub>7</sub>cycloalkyl, hydroxy, formyl, acetyl, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl, C<sub>2</sub>-C<sub>20</sub>alkenyl, carboxy, carboxyC<sub>1</sub>-C<sub>3</sub>alkyl, C<sub>1</sub>-C<sub>3</sub>alkylcarbonylC<sub>1</sub>-C<sub>3</sub>alkyl or carboxyallyl;

R<sub>2</sub> and R<sub>3</sub> are independently of each other hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl carbonyl or C<sub>1</sub>-C<sub>20</sub> alkyl;

with the proviso that compounds wherein OH is in the para position with respect to the ether linkage and R<sub>1</sub> and R<sub>3</sub> are both hydrogen and R<sub>2</sub> is methoxy or methyl; or a compound wherein OH is in the para position with respect to the ether linkage R<sub>2</sub> is hydrogen, R<sub>1</sub> is isopropyl and R<sub>3</sub> is methyl are excluded;

as antimicrobial agents.

2. Use of the compounds according to claim 1 wherein in formula (1) when OH is in the para position with respect to the ether linkage

$R_1$  and  $R_2$  are independently of each other hydrogen,  $C_1$ - $C_{20}$ alkyl,  $C_1$ - $C_6$  alkyl carbonyl or  $C_1$ - $C_{20}$ alkoxy;

$R_3$  is hydrogen,  $C_1$ - $C_{20}$ alkyl or  $C_1$ - $C_{20}$ alkoxy;

$R_4$  is hydrogen,  $C_1$ - $C_{20}$ alkyl, hydroxy, formyl, acetonyl, allyl, carboxymethyl, carboxyallyl, hydroxy substituted  $C_1$ - $C_{20}$ alkyl or  $C_1$ - $C_6$  alkyl carbonyl;

wherein when OH is in the meta position with respect to the ether linkage

$R_2$  is hydrogen,  $C_1$ - $C_{20}$ alkyl, hydroxy substituted  $C_1$ - $C_{20}$ alkyl or  $C_1$ - $C_6$  alkyl carbonyl;

$R_1$  and  $R_3$  are independently of each other hydrogen,  $C_1$ - $C_6$  alkyl carbonyl or  $C_1$ - $C_{20}$ alkyl;

$R_4$  is hydrogen,  $C_1$ - $C_{20}$ alkyl, hydroxy, formyl, acetonyl, allyl, carboxymethyl, carboxyallyl, hydroxy substituted  $C_1$ - $C_{20}$ alkyl or  $C_1$ - $C_6$  alkyl carbonyl;

wherein when OH is in the ortho position with respect to the ether linkage

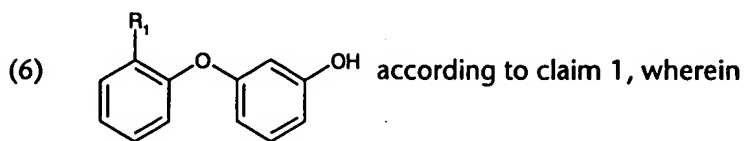
$R_1$  is hydrogen,  $C_1$ - $C_6$  alkyl carbonyl or  $C_1$ - $C_{20}$ alkyl;

$R_4$  is hydrogen,  $C_1$ - $C_{20}$ alkyl, hydroxy, formyl, acetonyl, allyl, carboxymethyl, carboxyallyl, hydroxy substituted  $C_1$ - $C_{20}$ alkyl or  $C_1$ - $C_6$  alkyl carbonyl;

$R_2$  and  $R_3$  are independently of each other hydrogen,  $C_1$ - $C_6$  alkyl carbonyl or  $C_1$ - $C_{20}$ alkyl;

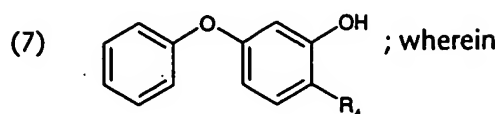
with the proviso that compounds wherein OH is in the para position with respect to the ether linkage and  $R_1$  and  $R_3$  are both hydrogen and  $R_2$  is methoxy or methyl; or a compound wherein OH is in the para position with respect to the ether linkage  $R_2$  is hydrogen,  $R_1$  is isopropyl and  $R_3$  is methyl are excluded.

3. Use of the compounds of formula



$R_1$  is  $C_1$ - $C_3$ alkyl.

4. Use of the compounds of formula



R<sub>4</sub> is C<sub>1</sub>-C<sub>3</sub>alkyl.

5. Use of the compounds according to one of claims 1 to 4 for finishing of undyed and dyed or printed fibre materials.

6. Use of the compounds according to one of claims 1 to 4 for the antimicrobial treatment of skin, mucous membrane or hair.

7. Use of the compounds according to one of claims 1 to 4 for the incorporation into and for the antimicrobial finishing of polymeric materials.

8. Use of the compounds according to one of claims 1 to 4 for the antimicrobial treatment of hard surfaces.

9. Use of the compounds according to one of claims 1 to 4 for the antimicrobial treatment of teeth and gums.

10. A personal care composition comprising at least one compound of formula (1) according to claim 1 and cosmetically tolerable carriers or auxiliaries.

11. An oral care composition comprising at least one compound of formula (1) according to claim 1.

12. A detergent composition comprising at least one compound of formula (1) according to claim 1.

13. Compounds of formula (1) wherein OH is in the ortho position with respect to the ether linkage and  $R_2$ ,  $R_3$  and  $R_4$  are hydrogen and  $R_1$  is  $C_1$ - $C_{20}$  alkyl.

14. Compounds of formula (1) wherein OH is in the meta position with respect to the ether linkage and  $R_2$ ,  $R_3$  and  $R_4$  are hydrogen and  $R_1$  is  $C_1$ - $C_{20}$  alkyl.

15. Compounds of formula (1) wherein OH is in the para position with respect to the ether linkage and  $R_2$  and  $R_4$  are hydrogen and  $R_1$  and  $R_3$  are  $C_1$ - $C_{20}$  alkyl.

16. A process for the preparation of compounds according to one of claims 13 to 15 comprising reacting a substituted phenol with an ether substituted halogenphenol in the presence of alkali and a catalytically active quantity of copper or of a copper compound, then heating the resulting alkyloxybenzol compound in the presence of hydrogen halide and acid.

17. Compounds of formula (1) wherein OH is in the ortho position with respect to the ether linkage and  $R_1$ ,  $R_2$  and  $R_3$  are hydrogen and  $R_4$  is in the meta position with respect to the ether linkage and is  $C_1$ - $C_6$  alkyl carbonyl.

18. Compounds of formula (1) wherein OH is in the meta position with respect to the ether linkage and  $R_1$ ,  $R_2$  and  $R_3$  are hydrogen and  $R_4$  is in the para position with respect to the ether linkage and is  $C_1$ - $C_6$  alkyl carbonyl.

19. A process for the preparation of compounds according to claims 17 and 18 which comprises reacting an acyl chloride with a phenoxyphenol in the presence of activated zinc at a temperature of between 70°C to 80°C, then heating the resulting acyl compound at a temperature of 145°C to 150°C in the presence of aluminium chloride.

20. Compounds of formula (1) wherein OH is in the meta position with respect to the ether linkage and  $R_1$ ,  $R_2$  and  $R_3$  are hydrogen and  $R_4$  is in the para position with respect to the ether linkage and is  $C_1$ - $C_{20}$  alkyl.

21. A process for the preparation of compounds according to claims 17 and 18 which comprises reacting an acyl chloride with a phenoxyphenol in the presence of activated zinc at a temperature of between 70°C to 80°C, then heating the resulting acyl compound at a temperature of 145°C to 150°C in the presence of aluminium chloride, then refluxing the resulting acylated phenol in the presence of amalgamated zinc, hydrochloric acid and a solvent such as toluene.